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Alcohol-, fat- and protein-containing foamable product, as well as process for the preparation thereof.

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A stable foamable product consisting of a homogenized mixture of fat, protein, water, alcohol, one or more calcium sources, one or more polyphosphates and/or lactates as foam stabilizing agents and a process of preparing such a product.

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Alcohol-, fat- and protein-containing foamable product and process for its preparation

The invention relates to an alcohol-, fat- and protein-containing foamable product.

When dealing with an alcohol-containing protein foam, most foam-stabilizing agents are not satisfactory, since the alcohol has a destabilizing effect on the foam.

Now it has been found that a polyphosphate, e.g. sodium hexametaphosphate and lactates are excellent stabilizing agents for a protein-, fat- and alcohol-containing foam, if a calcium source is also present.

The invention relates to a foamable product consisting of a homogenized mixture of fat, protein, water and alcohol, in which a calcium source is present and which comprises a polyphosphate, e.g. sodium hexametaphosphate and/or lactates.

All possible polylactates that are allowed in food production can be applied as stabilizing agent in a product according to the invention in amounts of 0.05-4 g/kg; preferably of 0.1-2 g/kg and most favourable, in amounts of 0.3-1 g/kg.

The lactates may consist of a dialysis product of milk, obtained for instance by an ultrafiltration treatment. In general, the lactates, whether or not combined with one or more polyphosphates, are applied as stabilizing agent in the same amounts as polyphosphates.

It is preferable that apart from a polyphosphate and/or lactate, the product also comprises one or more components that are known to stabilize foam that contains no alcohol, such as a polypropylene glycolal-ginate in an amount of 0.2-5 g/kg product and/or pectine in an amount of 0.1-5 g/kg product.

As a calcium source, e.g. cream powder or liquid cream can be used. Milk powder and milk can also be used for that purpose. The calcium source is added in such an amount, that the foamable product contains 1-70 g Ca per kg.

The invention also relates to a process for the preparation of a foamable product that is characterized in that a mixture of alcohol and water is added to a mixture of a calcium source, a protein, fat and one or more foam stabilizing agents, of which at least one is a polyphosphate, e.g. natrium hexametaphosphate, or comprises lactates, and possibly sweeteners, and in that subsequently the pH is adjusted to a value below 5 and in that the whole mixture is homogenized at increased pressure after possible addition of sweeteners, colouring agents and flavours. In this way substances can be included in the product that provide it with e.g. a chocolate, cocoa, vanilla and caramel flavour. Possible sweeteners are glucose, saccharose, dextrose, corn sugar, corn syrup, and synthetic sweeteners such as saccharin and aspartane.

The pH is preferably adjusted to a value of approximately 5 by means of glucondeltaalactone.

The pH reduction from 5.5 to below 5 is usually effected with other acids. Preferably tartaric acid, ascorbic acid and/or malic acid are used for that purpose. In small quantities, these acids provide a relatively steep pH reduction, which entails, however, a relatively slight-acid impression on the taste.

Generally it is preferred that the calcium source consists of a mixture of spraydried cream powder or liquid cream, water and one or more emulsifiers. The cream also favourably effects the sensation in the mouth as experienced by the consumer of the foamed final product, viz. the taste of a creamy product. As a calcium source, the cream powder can be replaced by milk powder, milk and other calcium sources.

Casein, soya proteins and the like can be applied for protein. Sodium caseinate is preferred. This has an emulsifying function that is many times stronger than that of monoglycerides. A product according to the invention may contain 1-70 g protein and 30-400 g fat per kg.

The alcohol can be present up to high percentages in a product according to the invention, e.g. in a percentage of the total weight of 4-45.

The alcohol can also be applied in the form of spirits, such as wine, molasses alcohol, vodka, brandy and liqueurs. Liqueurs are preferred.

The fat applied in a product according to the invention preferably has a low melting point, favourably below 32°C. E.g. coconut oil, cotton seed oil, peanut oil and palm oil can be applied. Coconut oil is preferred.

Products according to the invention can be whisked by hand or by electrical whisks. The foaming can also be performed from an aerosol can. In all cases the obtained foam is stable in a temperature range of -8°C to 50°C when using alcohol up to a maximum alcohol content of 40 vol.%. The foam is resistant to acid up to a pH of about 2.

If an extremely high stability of the foam that has been obtained with a product according to the invention is desired, e.g. when the foam is applied to hot beverages such as coffee, it is advisable to further homogenize the foamable product. It has been found that if the product according to the invention is homogenized at a pressure of 200 to 300 kg/cm² and a temperature below 20°C, the thus obtained foam is very stable.

The invention also relates to an aerosol can containing the product as described above, as well as a propellant, preferably N_2O gas, which has been pressurized.

The invention is further elucidated in the following example.

Example

A foamable product was prepared from the following groups of ingredients.

		<u>grammes</u>
10	<u>Group 1:</u> distilled monoglyceride	1.80
	lactic acid ester of monoglyceride	9.50
	acetic acid ester of monoglyceride	6.80
15	coconut fat (melting point 31° - $32^{\circ}C$)	67.50
	<u>Group 2:</u> cream powder (55% fat)	45.00
20	sodium caseinate	10.80
	antioxydants butylated hydroxy anisol +	
	butylated hydroxytoluene	0.10
25	water	200.00
	<u>Group 3:</u> water	160.00
	lactate and polyphosphates (dl-6)	0.54
30	trisodium citrate	0.90
	propylene glycolalginate (low viscosity)	1.26
	propylene glycolalginate (high viscosity)	0.27
35	high molecular citric pectine	1.80
	<u>Group 4:</u> glucose	40.50
40	saccharose	180.00
	corn sugar (hydrolyzed starch)	180.00
	<u>Group 5:</u> alcohol 96%	123.90
	water	157.00
45	flavour and colouring	as required
	Component 6 glucondeltalacton	3.00
50	Component 7 tartaric acid, ascorbic acid, malic acid	0.10

The monoglycerides of group 1 and the lactic acid and acetic acid esters thereof are emulsifiers with which the coconut fat and the milk fat originating from the cream powder of group 2 are emulsified. The coconut fat can be replaced by any other fat with a sufficiently low melting point in view of its taste. The components of group 1 are heated up to 80°C while mixing intensively. This is also done with the components of group 2. Subsequently the components of groups 1 and 2 are mixed at 80°C, at which temperature the mixture is homogenized at a pressure of 180 kg/cm². The components of group 3 are mixed separately for a minimum of 30 minutes at 85°C and added to the homogenized mixture of groups 2 and 3, after which the sweeteners of group 4 are added. Mixing is continued until all ingredients are dissolved, after which the mixture is quickly cooled to below 5°C. After stirring for at least one hour at this low temperature, the components of group 5 are added close to the stirrer and under continuous stirring. This method of adding is important because milk components should not be exposed to high alcohol percentages for too long.

Subsequently components 6 are added and mixing continuous until the glucondelta lacton are completely dissolved.

Then one stirs very slowly or for ten minutes normally every 2 hours for a minimum of 48 hours. Finally the pH is adjusted to 5.0 to 5.1 by means of component 7, after which the final product is homogenized at a pressure of 5.0 kg/cm². Then the product is suitable to fill the containers with. It will remain liquid in the containers for at least one year. It does not show viscosity increase if stored at a constant temperature.

Claims

1. Foamable product consisting of a homogenized mixture of fat, protein, water, alcohol and a calcium source containing lactates and/or polyphosphate, e.g. sodium hexametaphosphate.

2. Product according to claim 1, **characterized in that** the lactates consist of a dialysis product of milk.

3. Product according to one of the preceding claims, **characterized in that** the product comprises one or more components that have a foam-stabilizing effect on a foam containing no alcohol.

4. Product according to claim 3, **characterized in that** one or more foam stabilizers, belonging to a group consisting of polypropylene glycolalginates and pectine, are present therein.

5. Product according to one of the preceding claims, **characterized in that** cream functions as a calcium source.

6. Aerosol container containing a product according to one of the claims 1-5, as well as a pressurized propellant.

7. Process for the preparation of a product according to one of claims 1-5, **characterized in that** while stirring, a mixture of water and alcohol is added to a homogenized mixture of a calcium source, water, protein, one or more foam stabilizers, one of which being a polyphosphate or comprising one or more lactates, and if desired, sweeteners, colouring agents and flavours.

8. Process according to claim 7, **characterized in that** the homogenized mixture is cooled to below 5°C before adding the mixture of alcohol and water.

9. Process according to claim 8, **characterized in that** after having added the water and alcohol, the pH is lowered to at least 5.5.

10. Process according to claim 9, **characterized in that** at least the first stage of lowering the pH is effected by adding glucondelta lactone

11. Process according to claim 10, **characterized in that** the last stage of lowering the pH is effected by adding tartaric acid, ascorbic acid and/or malic acid.

12. Process according to one of the preceding claims 1-7, **characterized in that** the calcium source consists of spray-dried cream powder or liquid cream.



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X	E. CAMPBELL: "ENCYCLOPEDIA OF WORLD COOKERY" 10th edition, 1968, Spring Books, GB, page 224 * Page 224, paragraph 3 *	1,3,5,7 ,12	A 23 P 1/16
X	DE-A-3 123 972 (A. OETKER) * Claims 1,2; page 5, paragraph 2; page 6, paragraph 2; example *	1,3-5,7 ,9,12	
A	US-A-3 519 440 (J.W. STAACKMANN et al.) * Claims 1,11 *	1-3,6	
A	CHEMICAL ABSTRACTS, vol. 87, no. 25, 19th December 1977, page 564, no. 199491k, Columbus, Ohio, US; & JP-A-77 56 106 (ASAHI DENKA KOGYO K.K.) 09-05-1977 * Whole abstract *	1,3,4,7	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			A 23 L A 23 P C 12 G
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 28-07-1988	Examiner WIESER, M.R.J.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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